J. Agric. Sci. Mansoura Univ., 32 (5): 3413 - 3421, 2007

SEED BORNE FUNGI OF PEPPER (*Capsicum annuum* L.) IN EGYPT

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ABSTRACT

Sixteen pepper (*Capsicum annuum* L.) seed samples were collected from Alexandria markets and examined for the presence of seedborne fungi using the standard blotter and agar plate methods (ISTA, 1981). Observations revealed that *Alternaria alternate; Aspergillus* spp., *Cladosporium herbarum, Colletotrichum capsici, Curvularia lunata, Fusarium oxysporum, F. semitectum, F. solani, Penicillium* spp., *Rhizopus* sp., *Rhizoctonia solani* and *Stemphyllium* sp. were the most predominant fungi associated with pepper seeds. The standard blotter method was better than agar plate method as it detected 11 fungi compared to 8 fungi detected by the latter method. Pathogenicity tests revealed that some of the pepper seedborne fungi were capable to produce damping-off and wilt of the tested pepper cultivars. Seed infection levels of pepper with *Fusarium oxysporum* had significant effect on wilt incidence, for this reason it is recommended to use free seeds or with low infection levels to minimized wilt incidence. Culture filtrate either of *Fusarium oxysporum* or *F. solani* had reduced seed germination than that of *F. semitectum*.
Keywords: Disease incidences, seedborne fungi, wilt.

INTRODUCTION

Pepper (*Capsicum annuum* L.) seedborne fungi were reported by several authors. Hashmi, (1989) indicated that seed healthy testing of pepper seed samples from many countries showed the presence of *Alternaria alternate*, *Colletotrichum capsici, Fusarium moniliforme* [*Gibberella fujikuroi*], *F. semitectum* [*F. pallidoroseum*], *F. solani, F. equiseti, Fusarium oxysporum* and *Phoma capsici*. In pathogenicity tests, *Fusarium moniliforme*, *F. solani* and *Fusarium oxysporum* caused seed rot and wilt of *Capsicum* seedlings. Koleva and Vttanov, (1990) reported that *Fusarium oxysporum*, *F. solani* and *F. equiseti* caused stunting, chlorosis and root rot of pepper. Laing, (1990) showed that when 22 samples of *Capsicum annuum* seeds were tested for *Fusarium* spp. by the blotter method, *F. equiseti*, *Fusarium moniliforme*, *Fusarium oxysporum*, *F. semitectum* and *F. solani* were the most frequent isolated fungi. The isolated fungi reduced germination of *Capsicum* seeds by 98.6, 79.8, 62.1, 2.7 and 52.1 % respectively. In soil inoculation tests all transplanted *Capsicum* seedlings were killed by *Fusarium moniliforme* after 50 days and all surviving seedlings were pale and stunted. *Fusarium oxysporum* and *F. solani* killed 56% and 36% of seedlings respectively after 30 days. Padaganur and Naik, (1991) showed that unsterilized seeds from diseased *Capsicum annuum* fruits yielded mainly *Colletotrichum capsici* (75.5%), *Fusarium* (16.25%) and *Alternaria* (5%), while these from apparently healthy fruits yielded *Alternaria* (31.75%), *Aspergillus flavus* (16.5%), *Fusarium* (14.5%) and *Colletotrichum capsici* (1.25%). Anuja Gupta *et al.,* (1994) investigated that *Alternaria alternate, Aspergillus* spp., *Penicillium* spp., *Rhizopus* sp., *Chaetomium* sp., *Fusarium solani, F. moniliforme*, *F. semitectum* and *Colletotrichum dematium* were found on the

chilli seeds. Gurvinder Singh and Jain, (1996) indicated that culture filtrates of the seedborne fungi *Alternaria alternate; Aspergillus flavus*, *Aspergillus niger, Colletotrichum capsici, Drechslera rostorata, Emericella variecola, F. oxysporum* and *F. pallidoroseum* had a toxic effect and affected seed germination and root/shoot elongation. Mushtaq and Hashmi, (1997) isolated *Alternaria alternate*, *Cephalosporium acremonium,F. anthophilum, F. moniliforme, F. oxysporium, F. proliferatum, F. solani, Macrophomina phaseolina, Pythium aphanidermatum* and *Rhizoctonia solani* from roots, stems, leaves and seeds of infected plants of bell pepper (*Capsicum annuum*). Asalmol *et al.,* (2001) reported that the seedborne fungi *Aspergillus flavus*, *Rhizopus stolonifer, F. moniliforme, Colletotrichum capsici,* and *Aspergillus niger* were capable of causing damping-off mortality.

The present study was carried out with the aim to survey the seedborne fungi of pepper in Egypt and to find out the possibilities to minimize their harmful effect on the developing seedlings.

MATERIAL AND METHODS

Seed Health Testing:

Sixteen seed samples of pepper (*Capsicum annuum* L.) were collected from Alexandria markets. Seed healthy testing of the seed samples was carried out to check the fungi associated by using the two standard methods of agar medium and blotter (ISTA, 1966). In the agar method, 400 seeds of each sample were soaked in 1% sodium hypochlorite solution for three minutes, and then plated on PDA medium. In the blotter method, 400 seeds of each sample were directly plated on three moistened blotters. In both methods, 10 seeds were plated/dish then incubated at 20°C under 12 hours alternating cycles of near ultraviolet light (NUV) and complete darkness for seven days. The developing fungal colonies were examined using the compound microscope in case of agar test, and the stereobinocular in case of blotter. The infection percentages were recorded for each fungal isolate. The obtained fungi were purified using single spore or hayphal tip method and kept on PDA slants for further studies.

Pathogenicity Test:

Pathogenic capabilities of pepper seedborne fungi were tested in potted sterile soil. Four pots (25 cm diameter) for each treatment were filled with autoclaved aerated sandy clay soil. The pots were inoculated with the tested fungi and kept for seven days to secure establishment of the inoculated fungi, then sown with ten sodium hypochlorite surface sterilized pepper seeds. Five pepper cultivars were used throughout this work. The five tested pepper cultivars were Supper ammar, Marcato, Nour, California wonder, Kharn–El-Gazal. Check treatment comprised four replicates (4 pots), but without inoculation. The percentages of pre-, post-emergence damping-off, wilt and survivors of pepper cultivars were collected on the basis of number of seed sown in the check treatment after 30 and 60 days from planting. The data obtained were statistically analysed using the analysis of variance method after making arcsine transformation of the percentage of the

data obtained. Complete randomized design method adopted to compare the treatment means using least significant differences. (Steel and Torie, 1980).

Role of Seed Infection Levels on Damping-Off and Wilt Incidence:

The relationship between the seed infection levels with *F.oxysporium* and damping-off and wilt of three tested pepper cultivars namely, Supper ammar, Marcato and Nour was studied. Surface sterilized seed sample of each cultivar was soaked in fungal spore suspension (2500 spores/ml) for 4 hours. Seeds of each pepper cultivars were sown in pots filled with autoclaved aerated sandy clay soil (10 seeds/pot) at the rate of 10%, 20% and 30% infected/sterilized healthy seeds. Four replicates were used for each treatment. In check treatment sterilized healthy seeds only were used. Data was recorded 60 days after sowing.

Effect of the Tested *Fusarium* Culture Filtrates on Seed Germination:

The culture filtrates of *Fusarium oxysporum, F. semitectum* and *F. solani* were prepared as follows. The fungi were cultured in liquid potato dextrose medium and incubated at 25°C in the dark for 50 days. The fungal cultures were then filtered through double layered filter paper to remove the hyphae. The fungal filtrate was sterilized using 0.22 µm membrane filter (Millipore corp). surface sterilized seed sample of each five tested pepper cultivars were soaked for 4 hours in each fungal culture filtrate then placed on blotter moistened with culture filtrate (10 seeds/dish), incubated at 25°C for 2 weeks. Four replicates were used/ treatment. Sterilized water was used in check treatment.

RESULTS AND DISCUSSION

Seed Health Testing:

Fungi detected from pepper seeds using the standard blotter and agar plate methods are shown in Table1. Ten genera and twelve species of fungi were detected on pepper seeds of the collected sixteen samples. *Alternaria alternate* was developed on blotter and agar media at high rates in average of 18.5% and 22% respectively, followed by *Aspergillus* spp. 7.0% and 5.0%, *Cladosporium herbarum* 4.5% and 1.0%, *Colletotrichum capsici* 10.5% and 13.0% , *Curvularia lunata* 8.0% and 2.0%, *Fusarium oxysporum* 16.5% and 10%, *F. semitectum* 8.5% and 10.5%, *F. solani* 12% and 13.5%, *Penicillium* spp. 7.5% and 0.0%, *Rhizopus* sp. 8.5% and 0.0%, *Rhizoctonia solani* 7.5% and 6.0% and *Stemphyllium* sp. 2.5% and 0.0%. The most frequent isolated fungi were, *Alternaria alternate* and *Fusarium oxysporum* however, the least frequent ones were *Cladosporium herbarum* and *Stemphyllium* sp. Such results are in accordance with those reported by Banu *etal.,* (1990); Padaganur and Naik, (1991); Liang, (1993); Anuja *et al.,* (1994); Basak, (1994), Al-Kassim, (1996); Mushtaq and Hashmi, (1997) and Asalmol *et al.,* (2001).

T1

T2-3

In the present investigation, the two methods i.e. standard blotter and agar displayed most of the fungi associated with the pepper seeds, the blotter method yielded more fungi than agar method, as it detected 11 fungal isolates compared to 8 fungal isolates detected by the latter method. This result supports the finding of Usha *et al.,* (2000) who found that standard blotter method was better than agar plate method as it detected 16 fungi compared to 8 fungi detected by the lotter method.

Pathogenicity Test:

Pathogenic potentialities of certain seedborne fungi of pepper were tested on five pepper cultivars (Tables 2&3). Data in table 2 indicated that *Colletotrichum capsici*, *Fusarium oxysporum*, *F. semitectum*, *F. solani* and *Rhizoctonia solani* caused different degrees of pre-and post-emergence damping-off to the five tested pepper cultivars. *Rhizoctonia solani* caused the highest pre-emergence damping-off and *F. solani* caused the highest post-emergence damping-off. On the other hand, *Colletotrichum capsici* caused the lowest damping-off percentage. Data in table 3 also show that *F. oxysporum* and *F. solani* caused pre-emergence damping-off and wilt to the five tested pepper cultivars. The tested five cultivars differed in their degree of susceptibility to *Fusarium oxysporum* and *F. solani.* Super Ammar, Maracato and Nour cv. were highly susceptible while, California Wonder and Kharn-El-Ghazal were lower susceptible. Results in the same line were obtained by Ibrahimllari, (1987); Lukacs and Szarka, (1988); Hashmi, (1989); Koleva and Vttanov, (1990); Liang, (1990); Mushtaq and Hashmi, (1997) and Asalmol *et al.,* (2001).

Role of Seed Infection Levels on Pepper Damping-Off and Wilt Incidence:

Damping-off and wilt incidence of three tested pepper cultivars grown from seed samples artificially infested with different levels of *F. oxysporium* were studied. Data presented in tables 4 and 5 indicated that there are significant differences in the percentages of damping-off of pepper seedlings raised from the different infection levels of seeds (Table 4) and there are no significant differences in the percentages of wilted plants obtained from the moderate and the high seed infection levels.

Table 4: Effect of seed infection levels with *Fusarium oxysporum* on percentage of pre-and-post-emergence damping-off of pepper tested cultivars grown in potted-sterile soil for 30 days during May and June 2006.

Seed infection level (S.I.L)	Infection percentage											
	Pre-emergence				Post-emergence				Survivors			
	S	M	N	Mean	S	M	N	Mean	S	M	N	Mean
Highly (30%)	27.5	25.0	22.5	25.0	15.0	12.5	12.5	13.33	57.5	62.5	65.0	61.67
Moderate (20%)	15.0	12.5	12.5	13.33	10.0	10.0	7.5	9.17	75.0	77.5	80.0	77.5
Low (10%)	7.5	5.0	7.5	6.67	5.0	5.0	0.0	3.33	87.5	90.0	92.5	90.0
Healthy (Check)	0.0	5.0	2.5	2.5	0.0	2.5	2.5	1.67	100.0	92.5	95.0	95.83
Mean	12.5	11.88	11.25		7.5	7.5	5.66		80.0	80.62	83.22	
L S D												
Level: 3.55					**3.60**				**12.63**			
Cultivars: 4.09					**4.10**				**14.59**			

S= Super Ammar M= Marcato F N= Nour

On the other hand, there are significant differences between the percentages of wilted plants produced from the low seed infection level and these produced from moderate and high seed infection levels (Table 5).

Table 5: Effect of seed infection levels with *Fusarium oxysporum* on pre-emergence damping-off and wilt of pepper tested cultivars grown in potted-sterile soil for 60 days during May to July 2002.

Seed infection level S.I.L	Infection percentage											
	Pre-emergence				Wilt				Survivors			
	S	M	N	Mean	S	M	N	Mean	S	M	N	Mean
Highly (30%)	27.5	25.0	22.5	25.0	55.0	57.5	47.5	53.33	17.5	17.5	27.5	21.67
Moderate (20%)	15.0	12.5	12.5	13.33	55.0	55.0	50.0	53.33	30.0	32.5	37.2	33.44
Low (10%)	7.5	5.0	7.5	6.67	15.0	15.0	10.0	13.33	77.5	80.0	82.5	80.0
Healthy (Check)	0.0	5.0	2.5	2.5	2.5	0.0	0.0	0.83	97.5	95.0	47.5	96.67
Mean	**12.5**	**11.88**	**11.25**		**30.61**	**31.88**	**26.88**		**55.62**	**56.24**	**61.97**	

L.S.D.
Level: 3.55 4.5 16.91
Cultivars: 4.09 4.68 19.5
S= Super Ammar M= Marcato F N=Nour

This result show the importance of using healthy or low seed infection levels to minimize pepper damping-off and wilt losses and to have a profitable yield. These results are in accordance with this found by Michail *et al.,* (1998 and 2002).

Effect of the Tested *Fusarium* Culture Filtrates on Seed Germination:

Data in Table 6 showed that all the tested cultivar seeds were sensitive to culture filtrates of pepper seedborne *Fusarium*, although some culture filtrates were more toxic than others. Culture filtrates of *Fusarium oxysporum* and *F. solani* showed greater toxicity and reduced seed germination than those of *F. semitectum*. Data also indicated that seeds of Super Ammar, Marcato and Nour cultivars were more affected than those of California Wonder and Kharn-El-Ghazal. Similar results were obtained by Kumar and Mahmmod, (1987); Gurvinder Singh and Jain, (1996) and Usha *et al.,* (1998) who investigated the influence of culture filtrates of some seedborne fungi on pepper seed germination.

Table 6: Effect of pepper seedborne *Fusarium* culture filtrates on seed germination of pepper tested cultivars

Cultivars / Fungi	Seed germination percentage					
	S	M	N	C	B	Mean
Fusarium oxysporum	35.0	32.5	35.0	57.5	37.5	39.5
F. semitectum	70.0	67.5	72.5	62.54	65.0	67.5
F. solani	32.5	37.5	37.5	47.5	42.5	39.5
Check	100	97.5	97.5	100.0	100.0	99.0
Mean	**59.38**	**58.75**	**60.61**	**66.88**	**61.25**	

L.S.D.
Fungi: 4.43
Cultivars: 5.01
S= Super Ammar M= Marcato F N= Nour C=California Wander K= Kharn-El-Ghazal

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الفطريات القاطنة لبذور الفلفل في مصر

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جمعت ١٦ عينة من بذور الفلفل من أسواق الإسكندرية وفحصت لمعرفة الفطريات المصاحبة لها وأستخدم لذلك طريقتين قياسيتين هما طريقتي ورق الترشيح والآجار . تم عزل فطريات الألترناريا الترناتا، الأسبرجلس ، الكلادوسبوريم هيربباريم ، الكلوتوتريكم كابسيساي ، كيرفيولاريا ليوناتا ، فيوزاريوم اكسيسبورم ، فيوزاريوم سيميتيكتم ، فيوزاريوم سولاني ، بنيسليوم ، ريزوبس ، ريزوكتونيا سولاني ، ستيميفليوم . أوضحت النتائج أن طريقة ورق الترشيح كانت أفضل من طريقة الآجار حيث تم عزل ١١ فطر بها مقارنة بـ ٨ فطريات عزلت بالطريقة الأخرى . كما أوضحت التجارب أن بعض هذه الفطريات كانت قادرة على إحداث موت للبادرات وذبول لأصناف الفلفل المختبرة . كان لمستوى إصابة البذور بالفطر فيوزاريوم اكسيسبورم تأثير معنوي على إحداث الذبول مما يحتم إستخدام بذور سليمة أو ذات مستوى إصابة منخفض للحد من أمراض موت البادرات والذبول كما أوضحت الدراسة إنخفاض نسبة إنبات بذور بعض أصناف الفلفل عند تعرضها لإفرازات فطريات الفيوزاريوم .

3413 3414 3415 3416 3417 3418 3419 3420 3421 3422

Table 1: Comparison between the agar and the blotter method in seed health testing of pepper samples collected from Alexandria markets.

Fungi	Infection percentage															
	Accession number of samples															
	1		2		3		4		5		6		7		8	
	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A
Alternaria alternate	5.5	12.5	12	7	11.5	8.0	0.0	0.0	6.5	0.0	16.0	9.5	13.5	9.0	13.0	14.5
Aspergillus spp.	2.5	0.0	2	0.0	5.0	2	0.0	0.0	5.0	1.5	0.0	0.0	0.0	0.0	7.0	3.0
Cladosporium herbarum	1.5	0.0	4.5	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	2.0	1.0	0.0	0.0
Colletotrichum capsici	0.5	1.5	0.0	0.0	11.0	13.5	0.0	2.0	1.0	0.5	1.5	3.0	0.0	0.0	0.0	0.0
Curvularia lunata	0.0	0.0	3.0	1.0	0.0	0.0	0.5	0.0	0.0	0.0	1.0	0.0	2.0	0.5	0.0	0.0
Fusarium oxysporum	9.5	10.0	0.0	0.5	0.0	0.0	13.5	14.0	0.0	0.0	0.5	1.0	0.0	0.0	0.0	0.0
F. semitectum	0.0	0.0	0.0	0.0	0.0	0.0	1.5	4.0	5.5	5.0	0.0	1.0	8.0	10.5	2.5	2.0
F. solani	1.0	1.5	7.0	8.5	12.0	13.5	0.0	0.0	3.0	3.5	5.0	2.5	0.0	0.0	0.0	0.5
Penicillium spp.	0.0	0.0	3.5	0.0	4.0	0.0	1.5	0.0	0.0	0.0	6.0	0.0	0.5	0.0	0.0	0.0
Rhizopus sp.	7.0	0.0	0.0	0.0	3.5	0.0	6.5	0.0	0.0	0.0	0.0	0.0	7.0	0.0	8.5	0.0
Rhizoctonia solani	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	7.5	6.0	0.0	0.5	0.0	0.0	0.0	1.0
Stemphyllium sp.	0.0	0.0	1.5	0.0	0.5	0.0	2.0	0.0	1.5	0.0	0.0	0.0	1.5	0.0	0.0	0.0

Table 1: Continue

Fungi	Infection percentage															
	Accession number of samples															
	9		10		11		12		13		14		15		16	
	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A
Alternaria alternate	5.0	11.0	18.5	12.0	0.0	0.0	17.0	14.5	20.5	18.5	2.0	0.0	15.5	22.0	16.0	17.5
Aspergillus spp.	1.0	0.0	7.5	5.0	3.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	7.0	3.5	1.0	0.0
Cladosporium herbarum	1.0	0.5	0.0	0.0	0.0	0.0	2.0	0.5	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
Colletotrichum capsici	10.5	12.0	1.0	1.0	0.0	1.5	0.0	0.5	1.0	1.5	0.0	0.0	1.5	2.0	1.0	2.5
Curvularia lunata	8.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	3.5	2.0	0.0	0.0
Fusarium oxysporum	0.0	0.0	0.0	1.5	3.5	6.0	0.0	0.0	0.0	0.5	0.5	0.0	6.5	5.0	16.5	15.0
F. semitectum	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	7.0	1.5	3.0	2.5	3.0	0.0	0.0
F. solani	1.5	1.0	0.0	0.0	0.0	1.0	0.0	0.0	1.5	2.0	5.5	7.0	0.0	0.0	0.0	0.0
Penicillium spp.	3.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	5.0	0.0	2.5	0.0	9.0	0.0	7.5	0.0
Rhizopus sp.	3.5	0.0	7.5	0.0	2.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Rhizoctonia solani	0.0	0.0	0.0	0.0	3.0	5.5	0.0	1.0	2.0	0.5	0.0	0.0	0.0	0.0	4.5	5.0
Stemphyllium sp.	2.5	0.0	1.5	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.5	0.0	0.5	0.0	0.0	0.0

B: Blotter A: Agar

Table 2: Pre-and post-emergence damping-off of pepper tested cultivars grown in artificially infested soil for 30 days during May and June, 2006.

Cultivars / Fungi	Infection percentage																	
	Pre-emergence						Post-emergence						Survivors					
	S	M	N	C	K	Mean	S	M	N	C	K	Mean	S	M	N	C	K	Mean
Colletotrichum capsici	32.5	35.0	35.0	25.0	30.0	31.5	5.0	5.0	7.5	2.5	7.5	5.5	62.5	60.0	57.5	72.5	62.5	63.0
Fusarium oxysporum	37.5	40.0	45.0	22.5	27.5	34.5	17.5	15.0	12.5	12.5	12.5	14.0	45.0	45.0	42.5	65.0	60.0	51.5
F. semitectum	42.5	40.0	42.5	17.5	17.5	34.0	22.5	12.5	17.5	10.0	22.5	17.0	35.0	47.5	40.0	72.5	60.0	51.0
F. solani	42.5	25.0	30.0	22.5	25.0	29.0	15.0	20.0	25.0	7.5	22.5	18.0	42.5	55.0	45.0	70.0	52.5	53.0
Rhizoctonia solani	37.5	55.0	57.5	40.0	32.5	44.5	22.5	10.0	5.0	2.5	20.0	12.0	40.0	35.0	37.5	57.5	47.5	43.5
Check	2.5	7.5	2.5	2.50	2.50	3.5	0.0	0.0	0.0	0.0	0.0	0.0	97.5	92.5	97.5	97.5	97.5	96.5
Mean	**32.5**	**33.75**	**35.42**	**25.0**	**21.67**		**13.75**	**10.42**	**11.25**	**5.83**	**14.17**		**53.75**	**55.83**	**53.33**	**72.5**	**63.33**	
L S D Fungi:		**4.15**					**3.05**								**4.88**			
Cultivars :		**4.55**					**3.34**								**5.34**			

S= Super Ammar M= Marcato F N= Nour C= California Wander K= Kharn-El-Ghazal

Table 3: Pre-emergence damping-off and wilted plants of pepper tested cultivars grown in artificially infested soil with two *Fusarium* spp for 60 days during May and June, 2006.

Cultivars / Fungi	Infection percentage																	
	Pre-emergence						Wilt						Survivors					
	S	M	N	C	K	Mean	S	M	N	C	K	Mean	S	M	N	C	K	Mean
Fusarium oxysporum	37.5	40.0	45.0	22.5	27.5	34.5	60.0	50.0	47.5	12.5	37.5	41.5	2.5	10	7.5	65.0	35.0	24.0
F. solani	42.5	25.0	30.0	22.5	25.0	29.0	52.5	62.5	62.5	17.5	32.5	45.0	5.0	12.5	7.5	55.0	42.5	24.5
Check	2.5	7.5	2.5	2.5	2.5	3.5	2.5	7.5	2.5	2.5	2.5	3.5	95.0	85.0	95.0	95.0	95.0	93.0
Mean	**27.5**	**24.17**	**25.83**	**17.83**	**18.33**		**38.33**	**40.0**	**37.5**	**12.2**	**25.83**		**34.0**	**35.83**	**36.67**	**71.67**	**57.5**	
L S D Fungi:			**3.91**						**4.27**							**11.62**		
Cultivars :		**5.05**						**5.52**						**15.15**				

S= Super Ammar M= Marcato F N= Nour C= California Wander K= Kharn-El-Ghazal